

**WE CLAIM AS OUR INVENTION:**

*Sub B2* 1. A high-frequency oscillator (HFO) ventilator comprising;  
a first gas conduit having an opening adapted for gas connection with a patient's  
airways and a bias gas flow inlet and a bias flow outlet disposed to define  
therebetween a flow path for a bias gas within the first conduit;  
an oscillator for inducing pressure oscillations in gas within the first conduit to  
move said gas along a path intersecting the flow path for a bias gas  
alternately into and out of the opening at a predetermined high-frequency;  
~~and~~ *and said oscillator comprising an arrangement*  
for alternately introducing a volume of additional gas into and withdrawing at  
least the volume of gas from the first gas conduit to induce the pressure  
oscillations.

2. An HFO ventilator as claimed in claim 1 wherein said arrangement in the  
oscillator *is disposed to introduce*  
~~introduces~~ the volume of additional gas into the first gas conduit to intersect  
the bias flow path at a location proximal the opening.

3. An HFO ventilator as claimed in claim 1 wherein said arrangement  
comprises a second gas conduit arranged to introduce additional gas into the first gas  
conduit in a direction toward the opening, a gas pulse generator connected to said  
second conduit which introduces a train of gas pulses into said second conduit with  
each pulse contain the volume of additional gas and being separated from a next pulse  
in the pulse train by an inter-pulse interval and an extraction device which withdraws  
gas from the first gas conduit at least in each inter-pulse interval.

4. An HFO ventilator as claimed in claim 3 wherein the extraction device is in gaseous communication with the second gas conduit to withdraw the gas therethrough.

5. An HFO ventilator as claimed in claim 3 wherein the extraction device is in gaseous communication with the first gas conduit via a third gas conduit through which the extraction device withdraws the gas.

6. An HFO ventilator as claimed in claim 3 wherein the extraction device is in gaseous communication with an end of the first gas conduit distal the opening.

7. An HFO ventilator as claimed in claim 6 wherein the extraction device is further co-operatively in gaseous communication with the bias flow outlet to vent the withdrawn gas therethrough.

8. An HFO ventilator as claimed in claim 3 wherein the extraction device comprises a size variable gas holding volume in gaseous communication with the first gas conduit, the gas holding volume being defined at least in part by a wall section reciprocally moveable in timed relationship with the operation of the gas pulse generator to alternately increase the size of the gas holding volume to withdraw gas from the first conduit at least during said inter-pulse interval and to decrease the size of the gas holding volume to vent the withdrawn gas during said next gas pulse of the pulse train.

9. An HFO ventilator as claimed claim 1 wherein the oscillator introduces a volume of gas of between one and four milliliters per kilogram weight of a patient as said volume of additional gas.